

## CLAIMS

1. An implant for implantation in human or animal bone tissue or in bone tissue supplemented with bone substitute material, wherein at least a part of the implant surface comes into contact with the bone tissue, wherein said part of the implant surface comprises surface regions (4) of a first type and surface regions (8) of a second type being different from the surface regions (4) of the first type, wherein the surface regions (8) of the second type comprise a material which is liquefiable by mechanical oscillation and with the aid of which on implantation by mechanical oscillation the implant is stabilized at least primarily in the bone tissue, wherein the surface regions (8) of the first type are equipped for a further clinical function being different from the function of primary stabilization and wherein the surface regions (4, 8) of the first type and of the second type are dimensioned and arranged in a manner such that the surface regions of the first type remain at least partly free from liquefied material on implantation by mechanical oscillation.
2. The implant according to claim 1, wherein the clinical function of the surface regions (4) of the first type, which function is different from primary stabilization, comprises osseointegration, permeation of particles or molecules out of the implant into bone tissue surrounding the implant or out of bone tissue surrounding the implant into the implant or electric or chemical stimulation.
3. The implant according to claim 1, wherein the liquefiable material is a material with thermoplastic properties or with thixotropic properties.
4. The implant according to claim 3, wherein the liquefiable material is a polymer based on lactic acid and/or glycolic acid, a polyhydroxy alkanoate, a polycaprolactone, a polysaccharide, a polypeptide, a polydioxanone, a polyanhydride, a polyolefin, a polyacrylate, a polymetacrylate, a polycarbonate, a polyamide, a polyester, a polyurethane, a polysulphone, a polyarylether, a polyimide, a polyphenyl sulphide, a liquid crystal polymer, a polyacetal, a halogenated polymer, in particular a halogenated polyolefin, a polyphenylene sulphide, a polysulphone, or a polyether or a copolymer or blended polymer of the said polymers or a composite material containing one of said polymers, or a polymeric, ceramic or hydraulic cement.
5. The implant according to claim 1, wherein the surface regions (4) of the first type comprise structures suitable for being ingrown or grown through by vital bone tissue.

6. The implant according to claim 5, wherein the surface regions (4) of the first type further have inflammation-inhibiting, infection-combating and/or growth-promoting properties.
7. The implant according to claim 1, wherein the surface regions (4, 8) of the first and of the second type are arranged beside each other and in parallel to an implantation direction (A).
8. The implant according to claim 1, comprising a central implant part (1) constituting the surface regions (4) of the first type and a peripheral implant part (2) being arranged on the outside of the central implant part, consisting at least partly of the liquefiable material and constituting the surface regions (8) of the second type.
9. The implant according to claim 8, wherein the surface regions (8) of the second type protrude at least locally over the surface regions (4) of the first type.
10. The implant according claim 1, comprising a central implant part (1) constituting the surface regions (4) of the first type and comprising an inner space (2') in which the liquefiable material is arranged or arrangeable, wherein the inner space (2') is connected to the outside of the central implant part (1) by openings (20) which are dimensioned for pressing the liquefiable material when liquid through and which are arranged in an area in which the surface regions (8) of the second type are to be produced.
11. The implant according to claim 7, wherein the implant has a load bearing function and the central implant part (1) constitutes the load bearing element of the implant.
12. The implant according to claim 11, wherein the central implant part (1) consists at least partly of a metal, a metal alloy, a ceramic material, a polymer or a composite material.
13. The implant according to claim 11, wherein the central implant part (1) comprises self-cutting or grooving elements.
14. The implant according to claim 11, wherein the central implant part (1) comprises a load bearing part (1.1) and a body part (1.2) having a variable shape.
15. The implant according to claim 11, wherein the central implant part (1) comprises a load bearing support (1.3) and a body (1.4).
16. The implant according to claim 15, wherein body (1.4) comprises a bone substitute material, bone chips or a gel.

17. The implant according to claim 8, wherein the peripheral implant part (2) is equipped for being a load bearing implant part.
18. The implant according to claim 17, wherein the central implant part (1) is a container having permeable walls or consists of a bone substitute material, of bone chips or of a gel.
19. The implant according to claim 1, being a dental implant and comprising at least one fixing location (3) or at least one crown part.
20. The implant according to claim 1, being equipped for an orthopedic application.
21. The implant according to one of claims 19 or 20, being pin-shaped, plate-shaped, disk-shaped or blade-shaped or having a shape being adapted or adaptable to the shape of a predetermined cavity in a bone.
22. The implant according to claim 20, being equipped for connecting two bone parts or for fixing a support plate or for serving as a shaft of a prosthesis for a hip joint, finger joint, knee joint, or shoulder joint.
23. The implant according to claim 1, having the shape of a spinal disk and comprising on its lower and upper side at least one ridge (40), wherein the surface regions (8) of the second type are arranged in the area of the ridges (40).